

CLAIMS

What is claimed is:

1. A spoked wheel for a bicycle comprising a rim (3), a hub (2) defining an axis having a first anchoring portion (2a) and a second anchoring portion (2b) for anchoring spokes, and a plurality of spokes, that connect the hub (2) to the rim (3), in which a first set of spokes (A) is connected to the first anchoring portion (2a) of the hub (2) and a second set of spokes (B) is connected to the second anchoring portion (2b) of the hub (2), wherein at least two spokes (A) of at least one of the two sets of spokes (A, B) are grouped together so as to form a pair (C) in which no spoke of the other set is interposed.
2. The spoked wheel of claim 1, wherein the points of attachment to the rim (3) of the spoke pair (C) are close to one another.
3. The spoked wheel of claim 2, wherein the points of attachment to the rim (3) of the spoke pair (C) present a distance (L) equal to or less than 60% of the pitch (P) of a conventional wheel having the same total number of spokes.
4. The spoked wheel of claim 2, wherein the points of attachment to the rim (3) of the spoke pair (C) present a distance (L) equal to or less than 40% of the pitch (P) of a conventional wheel having the same total number of spokes.
5. The spoked wheel of claim 2, wherein the points of attachment to the rim (3) of the spoke pair (C) present a distance (L) equal to or less than 25% of the pitch (P) of a conventional wheel having the same total number of spokes.
6. The spoked wheel of claim 2, wherein the points of attachment to the rim (3) of the spoke pair (C) present a distance (L) approaching zero.

7. The spoked wheel of claim 6, wherein the points of attachment to the rim (3) of the spoke pair (C) (A) coincide in a single point of attachment to the rim (3).

8. The spoked wheel of claim 1, wherein all the spokes belonging to said set of spokes (A) are grouped together in pairs (C) set at angular distances apart from one another.

9. The spoked wheel of claim 1, wherein at least two spokes of the second set of spokes (B) are grouped together into pairs (C).

10. The spoked wheel of claim 9, wherein the points of attachment to the rim (3) of the spoke pair (C) (B) are close to one another.

11. The spoked wheel of claim 9, wherein all the spokes belonging to said second set of spokes (B) are grouped together into pairs (C) set at angular distances apart from one another.

12. The spoked wheel of claim 11, wherein the pairs (C) of spokes (B) of the second set are alternated at angular distances with the spoke pairs (C) of the first set.

13. The spoked wheel of claim 11, wherein the spoke pairs (C) of the second set are in angular positions which substantially coincide with those of the spoke pairs (C) of the first set.

14. The spoked wheel of claim 1, wherein each spoke pair (C) is made up of two spoke sets according to two tangential directions with respect to the axis of the wheel.

15. The spoked wheel of claim 14, wherein the two tangential directions converge outwardly.

16. The spoked wheel of claim 1, wherein the points of attachment to the rim (3) of the spoke pair (C) present a distance (L) smaller than a maximum diameter of the hub (2)

17. The spoked wheel of claim 1, wherein the number of spokes of the first set (A) is greater than the number of spokes of the second set (B).

18. The spoked wheel of claim 17, wherein the number of spokes of the first set (A) is twice the number of spokes of the second set (B).

19. The spoked wheel of claim 18, wherein the spokes (B) of the second set are single spokes.

20. The spoked wheel of claim 19, wherein the single spokes (B) of the second set are angularly interposed to the spoke pairs of the first set.

21. The spoked wheel of claim 19, wherein the spokes (B) of the second set extend radially if viewed in the direction of the axis of the wheel.

22. The spoked wheel of claim 1, wherein tensions of the spokes (A) of the first set and the tensions of the spokes (B) of the second set are substantially balanced with respect to one another in the direction of the axis of the wheel.

23. The spoked wheel of claim 1, wherein the spokes of the first set (A) present an inclination (α) with respect to a median plane (M) of the wheel that is

smaller than an inclination (β) of the spokes (B) of the second set with respect to said median plane (M).

24. The spoked wheel of claim 23, wherein the sum of tensile forces of the spokes (A) of the first set, in respective radial planes containing the axis of the wheel, and the sum of the tensile forces of the spokes (B) of the second set, in respective radial planes containing the axis of the wheel, are in a ratio to one another that is equal to the inverse ratio ($\sin\beta/\sin\alpha$) between the sines of the respective angles of inclination (α, β).

25. The spoked wheel of claim 1, wherein the spoke pairs (C) of the first set are arranged at equal distances apart.

26. The spoked wheel of claim 25, wherein the spoke pairs (C) of the second set are arranged at equal distances apart.

27. The spoked wheel of claim 26, wherein each spoke pair (C) of the second set is arranged in a position equidistant between two adjacent spoke pairs (C) of the first set.

28. The spoked wheel of claim 25, wherein the single spokes (B) of the second set are evenly spaced apart.

29. The spoked wheel of claim 28, wherein each spoke (B) of the second set is arranged in a position equidistant between two adjacent spoke pairs (C) of the first set.

30. The spoked wheel of claim 29, wherein it is a rear wheel.

31. The spoked wheel of claim 18, wherein the side of the wheel with twice the number of spokes is the one corresponding to the portion of the hub which carries a sprocket cassette (5).

32. The spoked wheel of claim 12, wherein the wheel comprises an identical number of spoke pairs of the first set and of the second set.

33. The spoked wheel of claim 12, wherein the wheel is a front wheel.

34. The spoked wheel of claim 8, wherein the number of spoke pairs of the first set is between 4 and 14.

35. The spoked wheel of claim 11, wherein the number of spoke pairs of the second set is between 4 and 14.

36. The spoked wheel of claim 19, wherein the number of single spokes of the second set is between 4 and 14.

37. The spoked wheel of claim 7, wherein the two spokes (A) of each pair (C) converge until they are joined together by a connection element (D) to the rim.

38. The spoked wheel of claim 37, wherein said common connection element is provided with connection means to the rim that make it possible to simultaneously tension the spokes of said pair.

39. A bicycle wheel comprising:
a hub having an axis (X) and a median plane (M) generally perpendicular to the axis (X);
a rim; and

a plurality of spokes, arranged in sets of spokes, connecting the hub to the rim,

wherein a first set of spokes connect a first portion of the hub to the rim on a first side of the median plane and a second set of spokes connect a second portion of the hub to the rim on a second side of the median plane and the spokes on each side of the median plane produce generally equal forces in opposite directions along the axis (X) that maintain the rim centered about the median plane.

40. The spoked wheel of claim 39, wherein in each set of spokes are arranged so that no spoke of the other set is interposed.

41. The spoked wheel of claim 39, wherein the spokes of each group of spokes, viewed in the direction of the wheel's axis, have an arrangement that is specular with respect to a radial plane of symmetry.

42. The spoked wheel of claim 41, wherein in each set of spokes, the spokes connected to at least one of the two hub portions include a spoke which, when viewed in the direction of the wheel's axis, is set at the center between two sets, in said radial plane of symmetry.

43. The spoked wheel of claim 39, wherein spokes on the second side of the median plane extends radially from the hub to the rim when viewed in the direction of the wheel's axis.

44. The spoked wheel of claim 39, wherein the spokes of the first and second sets of spokes are arranged in pairs.

45. The spoked wheel of claim 44, wherein the spoke pairs of the first set are connected to a hub portion on the first side of the median plane and the spoke

pairs of the second set are connected to a hub portion on the second side of the median plane, said hub portions set at an axial distance apart.

46. The spoked wheel of claim 44, wherein tensile forces of the spokes of each set of spokes have components in the direction of the axis of the wheel and are substantially balanced with one another.

47. The spoked wheel of claim 45, wherein tensile forces of the spoke pairs connected to the hub portion on the first side of the median plane are substantially equal to one another.

48. The spoked wheel of claim 45, wherein the sum of tensile forces of the spokes connected to the hub portion on the first side of the median plane and tensile force of the spokes connected to the hub portion on the second side of the median plane have their tensile force components in a plane containing the axis of the wheel, and wherein the components are in a ratio with respect to one another that is substantially equal and inverse to the ratio of the sines of respective angles of inclination with respect to said median plane.

49. The spoked wheel of claim 43, wherein the wheel is a rear bicycle wheel and wherein the spokes are oriented with all of the radially extending spokes on the same hub portion, so that one hub portion has twice the number of spokes than the other hub portion.

50. The spoked wheel of claim 49, wherein the hub portion with twice the number of spokes than the other is the hub portion corresponding to the end of the hub which accepts a sprocket cassette.

51. The spoked wheel of claim 39, wherein the spokes connecting the first hub portion to the rim and the spokes connecting the second hub portion to the rim have identical angular positions.

52. The spoked wheel of claim 51, wherein the spokes converge at a point on the rim.

53. The spoked wheel of claim 39, wherein the spokes connecting the first hub portion to the rim and the spokes connecting the second hub portion to the rim are alternately arranged between spoke pairs and single spokes on the same hub portion.